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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,027	11/06/2008	Jacob M. J. Den Toonder	EPC-018	8117
25962 7590 07/07/2011 SLATER & MATSIL, L.L.P. 17950 PRESTON RD, SUITE 1000 DALLAS, TX 75252-5793				
EXAMINER MORELLO, JANEL COMBS				
ART UNIT 1733		PAPER NUMBER		
NOTIFICATION DATE 07/07/2011		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@slater-matsil.com

### Office Action Summary

**Application No.**

10/578,027

**Applicant(s)**

DEN TOONDER ET AL.

**Examiner**

JANELLE MORILLO

**Art Unit**

1733

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 March 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8, 9 and 12-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-7, 10, 11 and 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 01/27/11
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to clearly show/label “free standing thin film” as described in the specification (second electrode #30 ? this needs to be clear). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Interpretation***

2. The instant invention is drawn to “an alloy of aluminum” (independent cl. 1, 11, 18), which, is equivalent to, and more commonly termed by one of skill in the art “aluminum alloy” or aluminum based alloy (see instant specification [0001], [0011], [0015], [0019], examples, etc).
3. Further, said independent claims 1, 11, 18 recite “an alloy of aluminum and at least magnesium”, but do not explicitly (or implicitly) refer to a minimum amount of Mg. Therefore, the instant claims are held to have at least impurity amounts of Mg.
4. If this interpretation is not consistent with applicant’s intended interpretation, please clarify (including where said interpretation is found in the original specification) in response to this action.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7, 10, 11, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagihara et al (US 6,791,188) in view of Grupp.

Hagihara teaches an aluminum alloy comprising (in at%): 0.5-15at% Cu and Mg (abstract), which overlaps the composition in claims 1-7 and 10. Hagihara teaches a thin film several microns or less (column 3 line 45) with low hillocks and specific resistance (column 3 lines 58-59) is sputtered from a sputtering target of said alloy, onto a substrate (abstract), and is suitable for electrode or wiring materials in semiconductor elements (column 3 lines 55-56).

Hagihara does not teach removing the substrate/forming a free standing thin film of said Al-Mg-Cu overlapping alloy.

However, Grupp teaches forming aluminum free-standing thin film by using a sacrificial silicon nitride substrate, and wet etching said substrate (column 4 line 56- column 5 line 14), which reveals unsupported portions/free-standing structure of aluminum film. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have sputtered the Al-Mg-Cu thin film of Hagihara onto a sacrificial silicon nitride substrate of Grupp, and further wet etched said substrate to form a free standing structure of Al-Mg-Cu thin film, because Grupp teaches it is known to remove substrates when it is desired to form free-standing thin films.

Concerning new claims 18-20, neither Hagihara nor Grupp teach the particular electrode configuration as claimed, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed/applied the Al-Cu-Mg thin film of Hagihara combined with Grupp in the claimed particular MEMS structure, because Hagihara and Grupp teaches an overlapping composition, and Grupp teaches said free standing thin films are useful in variety of MEMS applications (column 3 lines 8-16).

7. Claims 1-3, 11, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over “Mechanical Tests of Free-Standing Aluminum Microbeams for MEMS Applications” (hereinafter Zhang) in view of “Aluminum and Aluminum Alloys” p 637.

Concerning independent claim 1 and 11, Zhang teaches an electronic device (p 1, abstract) comprising a free standing thin film made out of “pure” aluminum (abstract, examples, etc). Zhang does not teach alloying aluminum with magnesium, but teaches an Al-Ti alloy/i.e.

alloying Al with Ti. However, (pure) aluminum has impurity amounts of Mg of 0.18 ppm, for zone refined aluminum (see “Aluminum and Aluminum Alloys” p 637, Table 1). Because instant claim 1 does not have a minimum range of Mg that is ‘alloyed’ with aluminum (rather than found as an impurity), and because “Aluminum and Aluminum Alloys” teaches 0.18 ppm Mg is expected for pure aluminum, Zhang together with teaching reference “Aluminum and Aluminum Alloys” has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 2, 3, “Aluminum and Aluminum Alloys” p 639 teaches that other elements are present in pure aluminum, such as Cu (0.09 ppm).

Concerning new claims 18-20, Zhang teaches free-standing thin films are useful in many MEMS applications (abstract, Introduction, p 1, etc). Zhang does not teach the particular electrode configuration as claimed, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed/applied the free standing Al thin film of Zhang in the claimed particular MEMS structure, because Zhang teaches an aluminum free standing thin film that overlaps the claimed “an alloy of aluminum and at least magnesium”, as well as said free standing thin films are useful in many MEMS applications (abstract, Introduction, p 1, etc).

8. Claims 1-3, 11, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grupp (US 6,261,943) in view of “Aluminum and Aluminum Alloys” p 637.

Concerning independent claim 1 and 11, Grupp teaches an electronic device (column 2 lines 44-55) comprising a free standing thin film made out of aluminum (column 6 lines 40-41). Grupp does not teach alloying aluminum with magnesium, but teaches layering Al-Ni-Al (column 6 line 42) or Al-Ag-Al (column 6 line 62). However, (pure) aluminum has impurity

amounts of Mg of 0.18 ppm, for zone refined aluminum (see “Aluminum and Aluminum Alloys” p 637, Table 1). Because instant claim 1 does not have a minimum range of Mg that is ‘alloyed’ with aluminum (rather than found as an impurity), and because “Aluminum and Aluminum Alloys” teaches 0.18 ppm Mg is expected for pure aluminum, Grupp together with teaching reference “Aluminum and Aluminum Alloys” has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 2, 3, “Aluminum and Aluminum Alloys” p 639 teaches that other elements are present in pure aluminum, such as Cu (0.09 ppm).

Concerning new claims 18-20, Grupp teaches free-standing thin films are useful in many MEMS applications (column 3 lines 8-16). Grupp does not teach the particular electrode configuration as claimed, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed/applied the Al thin film of Grupp in the claimed particular MEMS structure, because Grupp teaches an aluminum free standing thin film that overlaps the claimed “an alloy of aluminum and at least magnesium”, as well as said free standing thin films are useful in variety of MEMS applications (column 3 lines 8-16).

#### ***Response to Amendment/Arguments***

9. In the response filed on March 17, 2011 applicant amended claims 1, 7, 8, and added new claims 10-20. The examiner agrees that no new matter has been added.

10. Applicant’s arguments, see response 3/17/11, with respect to the rejection(s) of claim(s) 1-7 under Kojima in view of Zhang have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of

rejection is made in view of Hagihara and Grupp, Zhang and “Aluminum and Aluminum Alloys”, as well as Grupp and “Aluminum and Aluminum Alloys”.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JANELLE MORILLO whose telephone number is (571)272-1240. The examiner can normally be reached on 7:30 am- 6:00 pm Mon-Wed.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/  
Supervisory Patent Examiner, Art Unit  
1733

/J. M./  
Examiner, Art Unit 1733  
June 13, 2011



